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AUTHOR	Eisner, Elliot W.
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ABSTRACT

The production and sale of instructional materials are now big business in this country. Hence it is desirable, and probably necessary, to establish standards for such materials. Research in the area of curriculum materials is basically virgin territory. The evaluation of different types of curriculum materials will require the application of different types of criteria. Some suggestions regarding the distinctions between types of materials are made. With respect to curriculum materials which aim at the attainment of specific objectives, the educational significance of content, flexibility, durability, incidence of use by both teachers and students, ease of use, and educational effect are proposed as possible assessment criteria. (DG)

THE EVALUATION AND RESEARCH OF CURRICULUM MATERIALS*

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Elliot W. Eisner
Stanford University

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Although curriculum materials in a general sense have been used by teachers since the time teaching began, the large-scale production and sale of curriculum materials is a recent development, a child of the curriculum development movement. That movement, which started in 1952 with Max Beberman's work in mathematics at the University of Illinois now has a history spanning almost two decades. During that period we have seen curriculum development projects emerge in almost all fields of study including the arts. With the support of the National Science Foundation and the U. S. Office of Education projects in science and mathematics have received well over 100 million dollars in support over the past ten years. A significant portion of that amount as well as portions of the support provided for projects in the social studies and the arts are being spent on the development of material especially designed to accompany the new curricula.

If one thinks back to the more typical modes of curriculum making two patterns emerge as stark contrasts to the large-scale project approach that has characterized the past educational decade. One pattern is that of providing teachers with textbooks and leaving it to them to beg, borrow, steal or construct

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the resources necessary for working with children in a particular unit of study. The image of the elementary school teacher scurrying about to rescue old bags, cans, string, jars, wire and so forth with which to teach a lesson is neither false nor completely faded. The teacher, especially at the elementary level, was and is expected to improvise with found objects.

The second pattern is one of providing a curriculum guide but little else. In the first pattern, not even a guide is provided. The teacher receives the textbook but develops the educational program on her own. In the second pattern, the textbook and the guide are provided. The materials are not provided although they may be suggested.

Contrast these patterns with the well-designed, smartly-packaged, fully-integrated, multi-media kits provided by SRA, Heath and Co., Scott Foresman, General Learning, and so forth, and it will be easy to appreciate the difference in character between the old and the new approaches to curriculum making. With the availability of funds and the assumption that curriculum could be developed best not by the teacher but by specialized professional curriculum writers working under the guidance of an academic scholar and supported by the services of a profit-making corporation has come a host of new curricula and curriculum materials.

Now whenever programs developed in educational contexts remain small or are believed impotent the need for monitoring or for formulating standards by which to appraise them is similarly small. We tend not to worry about those things that we believe to be feckless. It is understandable therefore that interest has been

developing to find ways to review and appraise the quality of the curriculum materials that are being sold to school districts throughout the country.[1] When a field or a practice becomes important to the perceived welfare of a community, social controls are instituted to be sure that the community's welfare is protected. The desire to establish standards for curriculum materials is a reflection of such concern. And too it signals one of the hallmarks of a responsible profession---a willingness to monitor the quality of the service it affords its clients.

There is of course another good reason to establish criterial for the review of curriculum materials. The production and sale of such materials is big business. And business in America has not demonstrated marked responsibility in serving the public's interest. There are, of course, some exceptions but it would be unwise for educational scholars to rely on the merchant to monitor the quality of his own products, especially when the consumers are children. Thus we have a situation where for the first time in American educational history the field of education is beginning to think seriously about ways and means of developing and applying standards to ensure the quality of the educational materials that children in this country's schools will use. We are apparently coming to a point where it will be possible to review critically the materials that are sold to schools in light of their educational value.

With such a vision of the desirable comes many and severe problems, for although the desire is laudable, the means for realizing it are not especially clear. Louise Tyler and Frances Kline have taken very important first steps but there is much to be done. For example, conceptual clarification regarding types of curriculum materials and their modes of use have yet to be made.

Research on the utility and satisfaction teachers and students have with instructional materials are exceedingly hard to find in the literature. After searching five major journals in which such research might be found I was able to locate only four studies which are, at best, only remotely related to the kinds of questions that researchers can ask of instructional materials. Thus, in terms of quantified empirical data regarding variables such as frequency of use, satisfaction with materials, perceived difficulties of materials, and effects of materials upon student engagement and learning, we have a virgin territory for curriculum research.

Before any type of research can begin, a researcher must not only formulate a problem, he must make distinctions among the phenomena of interest that will enable him to pose questions worth asking. I believe it might be useful to distinguish between expressive materials which serve as heuristic devices for teaching or generating insights in a wide variety of areas within a curriculum and instructional materials designed to achieve highly specific objectives. For example, a chalkboard or a map can be conceived of as expressive materials that have, in principle, an infinite array of curriculum uses in the classroom. Such materials can be used for generating modes of inquiry whose products cannot be well predicted. Such devices are characterized by flexibility and by their ability to be used in ways that are not anticipated at the time they are designed or invented. Cuisnaire Rods in contrast are more specialized. Although Cuisnaire Rods have great flexibility their use is generally more circumscribed. They were invented for work within a particular field of study and are used to teach particular concepts, generalizations and operations. Color overlay boards or programmed

frames are even more specific. These materials usually fit into a sequential program of study and teach highly specific skills, concepts, generalizations and so forth. Such materials are aimed at the achievement of specific terminal behavior. The point here is that curriculum materials can be designed to serve a range of uses from the very general and flexible--a heuristic device would be an example--to the highly specialized instructional material that is designed to zero in on facilitating highly specific learning.

The relevance of these distinctions become apparent when one seeks criteria for assessing their effectiveness. If one has designed instructional materials for achieving highly specific outcomes the evaluation problem is straightforward: one appraises the value of the materials by the extent to which they achieve what they were designed to achieve. If, however, one is attempting to evaluate expressive curriculum materials one needs to discover the consequences of their use, the range of activities in which they are employed and the manner in which both teachers and students work with them. I cannot forget the experience I had observing a third grade girl viewing a single concept film developed to teach American children the firemaking skills of Australian aborigines. The small projector she monitored in her library carrel allowed her to stop the loop, rewind it, and replay it. As she sat and watched a naked adolescent male aborigine build a fire she stopped the loop, called her girl friend over, and both had a lesson on the structure of male genitals. What one hopes to teach, even when the materials are apparently

specific in focus, is not necessarily what is learned. The evaluation of curriculum materials needs to take into account the ancillary, unanticipated outcomes of the use of such material. Hence, one coordinate that can be identified to distinguish types of curriculum materials consists of those which are expressive and which serve as flexible heuristic devices related to the curriculum syllabii and those instructional devices which are considerably more limited or focused in the ways in which they can be used.

Another coordinate distinguishes types of curriculum materials along the teacher-student use dimension. Some materials are designed exclusively for teachers to demonstrate--students view the demonstration by the teacher but do not experiment with the materials themselves. The group film is an example of such a device. Other instructional materials are designed for student manipulation and inquiry. Puzzle boxes, Guisnaire Rods, and the small simple microscopes that are provided in the ESS materials are examples of the latter. One could review the materials that have been developed to accompany written curriculum guides to determine the incidence of teacher demonstration to student manipulation materials and these types in relation to the expressive instructional continuum that has been outlined earlier. Whether a high incidence of any of these four types of materials make any difference in the educational process is not a question that at present can be answered, at least, by appealing to empirical evidence.

The evaluation of different types of curriculum materials will require the application of different types of criteria. Some of these criteria will require inspection of the materials without necessarily examining their use in the classroom. Other criteria demand classroom observation and relate to how they are used, by whom,

and their effects. I would now like to identify some of the criteria that seem to me to be appropriate for appraising curriculum materials.

Perhaps the central question that can be asked of curriculum materials of an instructional type, that is, the type aimed at the attainment of specific objectives, is whether or not the content that is offered is educationally significant. It is possible of course to develop devices that although attractive teach educationally trivial content. And while the significance of educational content is to some degree contextual in character, in general, judgments can be made about the import that the material is designed to teach. Determining the significance of such content is a first step in appraisal for unless the material is judged to be educationally sound there is little reason to proceed with the application of other criteria.

What constitutes adequate criteria for judging the significance of educational content will depend upon the expertise of specialists in the field from which the content is drawn. The point is that judgments about the significance of the content that curriculum material is designed to teach is a primary element to be appraised in determining its adequacy.

A second criterion that can be applied to appraise curriculum material is one of judging its flexibility. By flexibility I mean the extent to which a given material can be used in different lessons or curriculum units. Materials which require the teacher to set up large and elaborate equipment to demonstrate one brief idea will tend to be avoided by teachers. In our own curriculum development work at Stanford we have tried to avoid asking teachers to set up a projector, a

screen and darken the classroom to show three or four slides to a class. The effort involved is not generally worth the reward. We have tried to design materials that could visually illustrate not only aspects of color or composition in painting and drawing but which could be used to illustrate a variety of other visual elements as well. Such flexibility reduces the amount of material a school district must buy as well as the amount of space that classroom teachers must make available. Thus, ideally classrooms would have materials that were flexible in the sense that they could be used in a variety of ways and efficient in the sense that they could be used for sustained periods.

A third criterion that can be applied to materials deals with the problem of producing materials that are durable. At Stanford we have had the experience of seeing second graders attempt to wash ink lines off of a plastic sheet attached to a cardboard backing. The ink lines, which were indeed washable, were to be wiped off with a damp sponge. Instead, the second graders took to more potent means and put them under the water tap. Needless to say what happened to the cardboard. We need to know how curriculum materials survive the rigors of classroom life and to find ways of extending that life whenever possible. When materials can be produced in consumable or non-consumable form I believe we should opt for a non-consumable type in spite of the reduced profit to merchant or designer. In the long run such economies might contribute to improved educational resources.

A fourth criterion for appraising curriculum materials deals with the incidence of their use by both teachers and students in the classroom. Some of the research techniques that Mattel uses to test new toys might well be applied to

evaluate new curriculum materials. Do the teachers and students use them? Do they enjoy using them? Do they think they could be improved? If so, How? The fact that a school or school district purchases curriculum materials is no guarantee that they will be used in the classroom. How much of such material gathers dust on the window shelf? When this happens how can the cause be determined? Is it due to the inherent unattractiveness of the material? Is it due to the fact that it is inappropriate for the setting? Is it due to a poor job of curriculum implementation? Whatever the reason, it is important to determine the incidence of use of curriculum materials. And to do that it will be necessary to either observe their use in the classroom or to establish some type of record keeping that will provide an accurate picture of how such materials are in fact being used.

A fifth criterion that can be applied to appraise curriculum materials deals with determining their ease of use. This criterion, logically, related to the previous one, deals with the demands that the materials make upon those who are to use them. For example, the use of alligator clips on materials young elementary school children are to use must be related to their ability to handle such clips. In our own project at Stanford we found that the stacking of art reproductions for storage caused some elementary school teachers to cut their fingers when pulling them out. It is unlikely that teachers will continue to use materials under such circumstances. We need to know how accessible these materials are and need to develop ways of finding out. If it is true that most of the materials that are designed to accompany curriculum guides are used only marginally it becomes

intriguing to find out why and to remedy the situation.

Finally, after all of these types of criteria are applied to appraise the quality, use, and satisfaction of curriculum materials the central question that must be asked of all educational inn ovations remains: Does it help educate those who use them? At present answers to this question from the standpoint of research are difficult to obtain. I would suggest that at least one way to answer such a question is to attempt to appraise the effects of curriculum materials wholistically. That is, to view their effects within the context of the total program. This approach is similar to determining the effects of a visual element in a pattern in the context of the pattern rather than by removing the element from the pattern and examining it independently. While the latter type of examination is appropriate for the application of some types of criteria (types which I have already described) the problem of judging the effects of materials needs, I believe, to be examined more organically since the effects curriculum materials have are determined in part by their interaction with other elements of the curriculum. Their appraisal therefore should, at least in part, be made in the context in which they function. To do this well will call for research methods that differ markedly from the types used in classical experimentation. To the fields of art criticism and cultural anthropology we might look to find new and more appropriate ways of appraising the tools we use to educate.

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